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CONTENTS

ELECTRIC POWER

Insulating Concrete for Superpower Electric Power Lines
(Ye. Loyko; STROITEL'NAYA GAZETA, 3 Apr 81) 1

Ukraine's Development of Fuel, Power Complex
(V. Kal'chenko, et al.; EKONOMIKA SOVETSKOY UKRAINY, Feb 81) 3

Cooperation in Production, Delivery of Power Equipment
(V. Kovalenko; SOTSIALISTICHESKAYA INDUSTRIYA, 17 Jun 81) . 12

Rogun Hydraulic Development Progress
(I. Akhmetov; STROITEL'NAYA GAZETA, 17 May 81) 15

Briefs
- Dubossarskaya GES Renovation 17
- Kansk-Achinsk Equipment 17
- Ekibastuz-Chelyabinsk Power Line 17
- Tajik Alpine Power Line 17
- Odesskaya Nuclear TETs 18
- Ekibastuzskaya GRES 18
- Tyumen' Gas Preparation 18
- Urengoy-Ukhta-Gryazovets Pipeline 18
- Centrifugal Compressor 18

FUELS

Expeditionary Team Method in Western Siberia Described
(V. T. Permyakov; EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA, Apr 81) 19

Lack of Planned Development in Khanty-Mansiysk Decried
(S. S. Chikirev; EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA, Apr 81) 22

Development of Equipment for Helium Production
(I. Kalashnikov; RABOCHAYA GAZETA, 7 May 81) 24

Briefs
Yakutia Gas Pipeline 26

GENERAL

Development, Production of Equipment for the North
(R. Arutyunov; SOTSIALISTICHESKAYA INDUSTRIYA, 16 Jun 81) . 27

ELECTRIC POWER

INSULATING CONCRETE FOR SUPERPOWER ELECTRIC POWER LINES

Moscow STROITEL'NAYA GAZETA in Russian 3 Apr 81 p 3

/Article by Ye. Loyko, chief engineer of the Siberian Scientific Research Institute of Power Engineering, and V. Mandrikov, chief engineer of the Sibelektroset'stroy Trust (Novosibirsk): "Superpower Electric Power Transmission Lines"/

/Text/ The construction of the first two superhigh-voltage electric power transmission lines--the Ekibastuz-Ural and Itat-Novokuznetsk lines--has begun.

With their construction the problem of decreasing the consumption of materials and first of all metal is becoming particularly urgent. Fundamentally new design decisions, which are based on the use of advanced materials, and the development of modern technologies of the installation of electric power transmission lines are required.

And here it is impossible, of course, not to speak about polymers, by means of which it is possible to solve many technical problems. But the arsenal of technical innovations is not limited to them. The insulating concrete, which was developed at the Siberian Scientific Research Institute of Power Engineering, is also very promising. The technology of its production is the same as the technology of the production of construction concrete. In both cases cement (Portland cement), sand and gravel serve as the ingredients. Drying provides it with the necessary insulating properties, a special impregnating compound promotes stabilization.

Concrete in an air-dried state contains quite a large amount of free water. It is this that determines its low dielectric properties. Upon drying the electric conductivity decreases and the dielectric strength increases. The impregnation of the dried concrete with water-repelling oils, for example, petrolatum, reliably protects it from moisture.

When determining the area of application of electroconcrete it is also necessary to take into account its advantages over other similar materials. One of the peculiarities is the fact that structural components with internal reinforcement, which are capable of absorbing large mechanical loads, can be made from it. The reinforcement should also be dielectric. Core fiberglass plastic is most suitable here.

Research on the development of dielectric tower components for superhigh voltages is now being conducted at the Siberian Scientific Research Institute of Power Engineering. And a number of studies of 110-500 kV substations, at which poles made of electroconcrete are being used instead of traditional metal or reinforced concrete portals in combination with chains of overhead support and insulating components made from porcelain insulators, have been conducted at the All-Union Scientific Research Planning Institute of Power Systems and Electric Power Networks for evaluating the areas of application and the technical and economic effectiveness of supporting structural members made from electroconcrete.

By means of electroconcrete structural members it is possible to build compact substations with rigid leads made from aluminum tubing. In this case the consumption of metal and scarce porcelain insulating material is also reduced.

In the near future we will make an experimental industrial check of these supporting structural members at 110-500 kV substations in order to accomplish during the 11th Five-Year Plan their extensive use in the construction of electric power networks.

Another, no less important development is the method of connecting the wires of electric power transmission lines by means of an explosion, which was also developed at the Siberian Scientific Research Institute of Power Engineering, but jointly with scientists of the Institute of Hydrodynamics of the Siberian Department of the USSR Academy of Sciences and specialists of the Sibelektroset'stroy Trust. This innovation has many advantages. It does not require pressing equipment, improves the quality of the connection of the wires and simplifies the process of their pressing. This method will find the most extensive use in the installation of high-voltage electric power transmission lines in hard to reach regions of Siberia.

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UKRAINE'S DEVELOPMENT OF FUEL, POWER COMPLEX

Kiev EKONOMIKA SOVETSKOY UKRAINY in Russian No 2, Feb 81 pp 13-19

[Article by Professor V. Kal'chenko, doctor of the economic sciences, and A. Kubrushko and B. Piriashvili, candidates of the economic sciences: "Problems of the Development and Refinement of the Fuel and Power Complex of the Ukrainian SSR"]

[Text] The fuel and power complex is a complicated production and economic system which is closely tied to all sectors of the national economy and has a definite impact on economic development. In directly influencing the rates, proportions and economic indicators for the development and configuration of the forces of production, increasing the efficiency of national production and accelerating scientific and engineering progress, it creates the prerequisites for improving the standard of living of the people.

A clear-cut program of action in the field of production and consumption of fuel and power resources for the upcoming decade is given in the project plan of the CPSU Central Committee, "The Major Trends in Economic and Social Development of the USSR for 1981-1985 and the Period up to 1990": improve the utilization of fuel and power resources, curtail the consumption of oil and petroleum products as boiler and furnace fuels as well as develop nuclear power engineering at an advanced pace. Moreover, the necessity of providing for a savings in fuel and power resources in the national economy amounting to 160 to 170 million tons of conventional fuel, including 70 to 80 million tons through a reduction in consumption norms is also indicated.

All of these stipulations, because of the noted trend towards a reduction in the level of supply of the Ukrainian SSR with its own fuel and power resources, become of paramount importance to the republic.

Until recently, the development of the fuel and power complex of the Ukrainian SSR was distinguished by a high level of efficiency. The growth in fuel extraction was primarily provided by virtue of the accelerated development of the petroleum and gas industry, something which had a positive impact on the technical and economic indicators for its extraction, transportation and consumption. The refinement of the structure of the fuel balance through an increase in the share of oil and gas has made it possible to significantly reduce the production cost and labor intensity of the extraction of one ton of conventional fuel, increase its average calorie content, reduce the expenditures for the fuel component and significantly improve the operational indicators for fuel consuming equipment.

However, the gradual exhaustion of the discovered resources of oil and gas, the increasing complexity of the mining geology conditions for coal extraction, the reduction in the level of the republic's own supply of energy resources to users in its economy and the exacerbation of the ecological situation has substantially changed the energy situation.

In the long term, the fuel and power sector of the republic will to an increasingly greater extent depend on the levels of development of its own base and on the ever increasing dependence of deliveries of fuel and power resources from the outside. In this situation, there arises the necessity of resolving such an important national economic problem as assuring the supply reliability of fuel and power resources for the constantly growing demand of the economy of the Ukraine. This depends on an entire series of factors: on the accelerated development of nuclear power engineering, the incorporation of new energy sources in the fuel and energy balance, the implementation of a widescale and universal set of measures to save fuel and power resources, the construction of underground gas reservoirs in the republic's territory on a wide scale, the expansion of existing and the construction of new petroleum refineries as well as on the further development of the coal industry. All of this will make it possible to significantly strengthen the republic's own fuel and power base, boost the reliability of the republics supply of fuel and power and thereby promote an increase in the efficiency of all national production.

Thus, the fuel and power complex is approaching that stage at the present time when its further development and refinement require the solutions for an entire series of large scientific and engineering problems in the fuel sectors, in electrical and thermal power engineering, transportation and in the utilization of fuel and energy.

In the consumption structure of boiler and furnace fuel in the national economy of the UkrSSR coal (32.2 percent) and natural gas (28.2 percent) have the major share. The consumption of coal in industry (including power generation) amounts to about 77 percent of all of the coal used in the national economy of the republic, 85.8 percent of the gas, 99 percent of the coke and 94.6 percent of the fuel oil. Some 84.4 percent goes for industry in the overall consumption of boiler and furnace fuel, including 48.6 percent for power generation. In this case, the specific share of coal in the consumption structure of the various kinds of energy carriers in power engineering amounts to 45 percent, 27.7 percent for gas and about 20 percent for fuel oil. Thus, the major energy carriers in power engineering, just as on the whole for the national economy, are coal and natural gas, for the share of which about 73 percent of all consumed energy resources are used.

Coal and gas are the major types of boiler and furnace fuel on the whole for the national economy. This was predetermined by the energy situation which developed in the republic in its own time when the Donetsk coal basin was the major fuel base of the nation, while in subsequent years, after the Shebelinsk gas fields were placed in industrial service, the republic took over the leading positions in gas extraction. Fuel utilization in this period was characterized by a high specific weight of fuel resources in overall energy consumption; the advanced growth of primary fuel resource consumption relative to their extraction in the republic; a significant increase in the fraction of fuel utilized for conversion to electrical and thermal power; the expansion of the scales of fuel utilization, primarily due to natural gas, furnace fuel oil and light petroleum products; as well as the high percentage of solid fuel and its refined products in the overall fuel consumption.

In working out an overall concept for the development of the fuel and power complex of the republic, the treatment of questions of energy supply development takes on special significance, something which requires first of all the analysis and ascertaining of the trend in the energy consumption sector. The long term demand of the Ukrainian SSR for fuel, heat and electrical power is governed by the specific features of the functioning of the republic's national economy as an indispensible component of the unified national economic complex of the nation, as well as a number of social and economic and natural historical factors. The future rates of growth of fuel resource consumption will depend primarily on the rates of growth of industrial potential; increases in the specific share of electrical power in the final consumption of energy; increases in the volumes of fuel refining and fuel refining enterprises; reductions in the rates of growth in the consumption of petroleum fuel and natural gas in power generating facilities and their wider utilization as a chemical raw material; a growth in the level of motorization of the economy; and reductions in the energy input requirements for the gross national product. Thus, over the period 1961 to 1980, the rates of growth in the gross product lead the rates of growth in fuel consumption. Such a positive trend in the development of the republic's economy will also be maintained in the long term.

Housing and municipal services is the second large fuel consumer after industry. Despite the trend towards the electrification of the housing and municipal services sector, the rise in fuel consumption in this sector will also keep up in the future. From all appearances, coal and natural gas will for a long time remain the major kinds of fuel here. In this case, the share of coal will fall off, while that of gas will rise.

A further development of the production forces of the republic, an increase in the efficiency of national production as well as providing for continuous growth in the well-being of the workers will to an increasingly greater extent depend on the volumes of fuel and energy deliveries from the eastern regions of the nation. It must be noted that despite the widescale development of specialized transportation for fuel, the transport of oil and gas to the Ukrainian SSR requires great outlays. Even with the degradation of the mining geology conditions for extraction, this does not reduce the national economic impact of further prospecting and development of deposits of fuel resources in the republic, all the more since in contrast to oil and gas, the transmission of electrical power over great distances requires the solution of an entire series of extremely complex scientific and engineering problems.

The considerable remoteness of the major fuel sources, the increased complexity of the system of long range transportation, the conditions for its operation and the structure of the gas supply system of the nation amplify the impact of random objective and subjective factors (natural, technical, etc.) on the continuity of the energy supply to the sectors of the republic's economy. This problem can be solved to a considerable extent by strengthening the republic's own fuel and energy base and creating reserves of fuel resources and power capacities on this basis. This will make it possible to increase the degree of flexibility in the fuel and power sectors, something which is quite important with the change in the resource support for extraction, the timeframes for the mastery of new technological processes, the sharpening of demand for power resources, etc.

A study of the resource base for the fuel and power sectors and the specific features of the formation of the long term fuel and energy balance of the republic shows that one of the major energy resources will be coal. In this regard, especially taking into account the large capital and funding input requirements for the coal industry, among the priority tasks is that of scientifically substantiating the levels of coal extraction. All the more since both overstating and understating these levels leads to considerable losses of material resources.

Making the decisions of the national economic necessity of developing individual coal basins only the basis of optimizing the development of the nation's fuel and power complex can lead to definite errors in the figures because of the high degree of aggregation of the raw data, which does not take into account the entire multiplicity of qualitative and quantitative characteristics of the coals. And while the results of such optimization calculations on the whole do not distort the general direction for energy policy, for specific coal basins, the orientation toward them can lead to substantial deviations from the economically expedient volumes of coal extraction by 20 to 30 million tons. And this can substantially change the policy in the field of planning for the prospecting of mine fields, the reproduction of the mining fund, coal reprocessing, etc.

Despite the intensive construction of nuclear electric power stations in the republic and the increase in the volumes of energy resource deliveries from the nation's eastern regions, it may prove necessary in the future to expand coal extraction in the UkrSSR up to a level limited by the number of prospected regions and the capacities of mine building organizations. The expedience of this today has already been essentially predetermined by the limited nature of the republic's own resource base for the petroleum and gas industry; by the fundamental competitive capability of electrical power based on Donetsk coals with electrical power generated at nuclear electric power stations or transmitted from the eastern regions of the nation, as well as by the approximately identical expenditures for the extraction of Donetsk coal and the transportation of Tyumen' gas to the republic; the necessity of increasing the reliability of the energy supply for the republic's economy. In this case, the fact must also be taken into account that the growth in energy potential of the coal industry will not be directly proportional to the increase in extraction because of the growth in the ash content of the coal which is mined. Moreover, there arises the necessity of exploiting sections with coals having a comparatively low calorie content. In the future, the existing large number of mines which extract high calorie content coals will go out of service, because of which, it is necessary to accelerate the geological prospecting work and mine construction in areas with high calorie power generating coals.

Considerable work has been done in the coal industry over the last two decades to refine the mining sector and technically retrofit the sector through the design and introduction of new means of mechanization of the cleaning and preparatory work, as well as further improved transportation equipment. However, because of the deterioration of mining geology conditions for the development of coal seams (the increase in depth, the reduction in the thickness of the seams, the instability of the side wall rock, the increase in rock pressure, temperature, etc.), the major technical and economic indicators for the coal industry are becoming worse.

Under such conditions, qualitatively new scientific, technical and organizational solutions are needed in the mining, transportation, reprocessing and utilization of coal. A transition must be made to more progressive methods of preparing the mine fields, the universal introduction of mechanization and automation of operations in the stopes and shortwalls. One of the major directions for further technical and social transformations in the coal industry is the creation of a technology without the permanent presence of personnel in the mines. The most important direction for increasing the economic efficiency of the coal industry is the comprehensive utilization of coal resources.

The transition from the predominant utilization of oil and gas to coal is an objective trend which has been noted on the whole in the worldwide fuel and energy balance. The expediency of such a transition, despite the necessity of fundamental changes in the technology for the extraction, transportation, reprocessing and use of coal, as well as in the implementation of widescale environmental protection measures, is quite obvious.

It is natural that such a formulation of the question in no way removes the issue of the necessity of further development of the petroleum and gas industry of the republic from the agenda. The characteristics of the deposits of oil and gas, by virtue of which the growth in industrial stocks was attained in recent years, attests to the quite clearly manifest trend towards a reduction in the scope of deposits being opened up. Consequently, despite the increase in the volume of search and prospecting work, there is little probability of anticipating the opening up of really large deposits prior to the performance of a large volume of deep and ultradeep drilling work.

In this regard, the search and prospecting work for oil and gas requires the solution of a series of scientific and engineering problems: the refining of the techniques and means for the prediction of oil and gas bearing strata; the introduction of an efficient set of direct geochemical and geophysical methods of locating deposits; the refining of the hardware and techniques for prospecting for structural forms which lie at great depths; the use of more effective washing liquids; the widescale introduction of diamond bits in conjunction with turbine drilling; the design of high performance drilling equipment, which provides for forced drilling of holes up to 8,000 m deep.

With an increase in the transportation volumes of energy resources from the eastern regions of the nation and the necessity of a fundamental improvement in the transportation network, the significance of measures to assure power supply reliability, as has already been noted, increases significantly. Within the framework of the republic, this requires the formation and optimization of a system of mobile national economic resources, which provide for the flexible and efficient functioning of the fuel and power complex. Thus, the construction of underground reservoirs for gas qualitatively changes the structure of a gas supply region, provides for independent operation of the sector under conditions of nonuniform gas consumption and promotes more effecient gas utilization as compared to its consumption by buffer users. Along with this, the probability of feeding the planned gas volume within the established timeframe can be increased by virtue of creating regulator deposits, back-up elements in the gas transport network, the construction of crossover gas pipelines as well as setting the gas transport systems up in rings and the optimal decentralization of gas flows incoming from the outside. The further development of the oil refining industry in the republic will make it possible to increase the reliability of the supply of oil refinery products to the national economy, in particular, benzine, furnace fuel oil and diesel fuel.

The problem of economizing on fuel and power resources is closely tied to the expansion of the power engineering base for production and finding additional energy resources. In this case, the savings act not only as a factor for increasing production efficiency, but under contemporary conditions, primarily as the most important factor in the expansion of energy sources and drawing on additional energy resources. In this case, the curtailing of losses in the stage of the production (extraction) of energy resources is of fundamental importance; this accounts for 59 percent of the losses. The introduction of new methods of developing deposits with a maximum degree of extraction from the earth is of especially great importance in this stage.

An extremely important direction for increasing the efficiency of fuel and power resource utilization is the further refinement of the technological processes, energy supply systems for enterprises, curtailing losses of energy resources and heat as well as increasing the level of their utilization and optimizing the equipment operating conditions. Great possibilities for saving energy resources are to be found in the centralization of the heat supply for the economy. In this case, the major direction for the improvement of the operation of central district heating remains the increasing of the percentage of electrical power generated for thermal consumption, which amounts to slightly more than 5 percent at the present time in the Ukrainian SSR, something which is four times less than for the nation as a whole. Fuel savings in the heat supply depend to a great extent on improving the thermal insulation properties of construction materials and using more efficient household equipment. The volumes of fuel consumption for transportation depend not only on the use of more economical engines, a growth in the load handling capacity, but also on an improvement in the efficiency of routing shipments, improving the pavings for motor vehicle highways, etc.

An extremely important approach to saving fuel is related to the development of nuclear power engineering, which provides a new, practically inexhaustible source of energy. In this case, obtaining energy at nuclear electric power stations is characterized by lower operational expenditures than at thermal power stations, something which compensates for the greater initial outlays and reduces the production cost of the generated power, decreases the specific demand for labor resources, promotes the elimination of atmospheric pollution and improves the reliability of the power supply system. In the long-term, the possibilities for improving the technical and economic indicators of the operation of the fuel powered electric power stations will be exhausted (especially considering the rise in outlays for the extraction and transportation of fuel). With the existing trend towards a reduction in expenditures for the generation of electric power at nuclear electric power stations, this requires approaching the prospects for the development of nuclear power engineering not solely from the viewpoint of covering the energy shortfall and saving fuel, but also from the viewpoint of increasing the efficiency in the development of the fuel and power complex.

The development of nuclear power engineering should likewise follow the path of designing nuclear thermal and electric central power stations as well as nuclear boilers. This, naturally, requires a correction in the concept of heat supply development and the implementation of the corresponding scientific and engineering developmental work. The economic expediency of using nuclear fuel for certralized heat supply can already be seen today in the European regions of the nation, all the more since along with saving fuel, this facilitates the resolution of questions of protecting the air basin, reduces the load on railroad transport, does not require approach roads, etc. In this case, it is essential to work out a long term scheme for the placement of nuclear electric power stations in the territory of the republic, which would take into account the entire complex of economic, ecological and social factors.

The rapid rise in the demand for energy, the limited nature of fuel reserves and the increasingly complicated ecological situation are responsbile for the necessity of solving such an important problem as the mastery of planetary energy sources: the energy of the sun, the wind, geothermal energy and others, where considerable experience has already been accumulated in world practice in the field of their utilization.

The development of solar power engineering opens up no few prospects in our nation too, especially in the regions of Central Asia. There are also rather favorable conditions for the widescale utilization of similar energy in our republic in the territories of the Odessa, Khersonskaya, Nikolayevskaya and Crimean oblasts, where the number of sunny hours amounts to about 2,500 annually.

Wind power represents a rather large energy resource. A rather widescale program for the utilization of the wind to generate electrical power is being developed in many nations of Western Europe and America. Thus, wind plants with a design velocity of 7 to 12 m/sec have already been constructed in Denmark, Belgium, France, England and other nations.

According to data of the All-Union "Tsiklon" scientific production association, the annual electrical power output of wind electric power stations, located on one percent of the nation's territory, can amount to about 10 percent of the entire demand for electrical power in the future. After the year 2000, wind power engineering will be able to provide up to 20 percent of the nation's total demand for energy.

The Donetsko-Pridneprovsk and the Southern economic regions are the most favorable for the use of wind power in the territory of the Ukrainian SSR, where the average wind velocity during a year amounts to 4 to 5 m/sec, and during the winter months, 7 to 12 m/sec. The latter is especially important, since it is specifically at this time that the entire power supply system of the republic operates under stress. Taking into account the fact that all of the populated points of the republic are connected to power system grids, the unconstant wind conditions will not undermine the reliability of the electrical power supply. At the same time, wind power generation provides not only for a fuel savings on a considerable scale, but also makes it possible to provide electric power to users in rural terrain, which is characterized by a high degree of decentralization of consumers and remoteness from centralized power systems. However, considering the possibilities for designing high capacity wind power plants with high technical and economic indicators and developing efficient techniques for storing energy, provisions should be made for the design in the future of grids of wind electric power stations with a capacity of millions of kilowatts, something which will make it possible for wind power generation to occupy a rather prominent place in the fuel and power complex.

An important power engineering problem is also the utilization of geothermal heat in the national economy. In many nations of the world, geothermal electric power stations are already being built. According to approximate estimates, their capacity in the world will reach 11 to 12 GW by 1985. Geothermal energy is finding ever increasing applications in industry and agriculture. According to data of the Institute of Geophysics and the Institute of Geology and Geochemistry of Combustible Minerals of the UkrSSR Academy of Sciences, favorable conditions exist in a number of regions of the Zakarpat'ye for the creation of subterranean thermal boilers, based on which, electric power stations with a total capacity of 20 to 25 million KW can operate for 30 years.

The possibilities for utilizing the heat of the earth in the republic in the immediate future will involve those territories where underground waters occur at a great depth or where they have a natural outlet. This predetermines their utilization primarily for purposes of hot water supply for buildings, agricultural, household and small production consumers. Their utilization in the Crimea is of great interest in this regard, where up to 80 percent of the known thermal sources of the republic are concentrated. According to preliminary estimates, just the utilization of the reserves of the Sivashskiy deposit at a temperature of +65 °C will make it possible to save one million tons of conventional fuel annually.

It must be noted that the known thermal waters in the territory of the UkrSSR are characterized by a low temperature, up to 80 °C. Water at a temperature of more than 100 °C can be used for thermal power engineering purposes though. For this reason, broad prospects for the application of geothermal energy are tied to the discovery of rock in the Crimea, Predcarpat'yev and Zakarpat'ye as well as the extraction of heat from a depth of six to eight km, something which requires the solution of a whole series of technical problems involving the extraction of heat from dry rock, which is a poor heat conductor.

For the practical implementation of a comprehensive program for the utilization of the earth's heat, widescale geothermal and hydrogeological studies are needed for the purpose of determining regions which are favorable for the construction of geothermal electric power stations. The requisite technical and economic justifications of the expediency of the construction of such power stations with a capacity of 1000 megawatts in Zakarpat'ye already exist at the present time.

The utilization of the low potential heat of the Black Sea is likewise of definite interest. The abundance of sunny days provides for its constant positive thermal balance at the southern shores of the Crimea. The existence of such a heat storage unit provides all of the basis for posing the question of designing new heat supply systems using heat carrying installations. According to the data of the Crimean Power Administration, such installations are twice as economical as group boiler facilities, while their application in the region near the southern shore of the Crimea will make it possible to save about 70,000 tons of conventional fuel annually, which amounts to about 50 percent of the fuel consumption in this region.

The significance of the utilization of planetary energy sources will increase in the long term, especially in individual regions of the nation, something which will make it possible to provide for a considerable savings in fuel and power resources. Given the condition of a planned scientific and engineering development of methods for the utilization of these energy sources and the attainment of a sufficient level of profitability for them, one will be able to consider their utilization on an industrial scale.

Thus, the development of the fuel and power complex in the long-term provides for the advanced development of electrical power engineering; the reorientation of the fuel balance towards the accelerated development of the coal industry, since coal will, as before, remain one of the major kinds of energy resources for the foreseeable future; the creation of the requisite reserves to assure the reliability of the energy supply of the national economy of the republic; the incorporation of new energy sources in the fuel and power balance; and the concentration of production capacities according to energy production and conversion.

In this regard, all of the questions related to the concept of fuel and power complex development for the long term future should be resolved on the basis of unified procedural principles with the clear-cut coordination of all scientific research in this field. Moreover, the time has now come when it is necessary to create a centralized administrative organ for the fuel and power complex, both for the nation as a whole and the republic in particular, something which will make it possible to more effectively resolve all of the issues related to increasing the efficiency of its development. Finally, it is likewise essential to refine the system of training highly skilled specialists capable of solving complex problems related to the development of the fuel and power complex.

All of this will promote the solution of one of the most important national economic problems: the problem of increasing the effectiveness of the development of the fuel and power complex of the Ukrainian SSR.

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COOPERATION IN PRODUCTION, DELIVERY OF POWER EQUIPMENT

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 17 Jun 81 p 1

/Article by V. Kovalenko, editor of SOTSIALISTICHESKAYA INDUSTRIYA for the department of machine building and new technology: "Get a Move on, 'Workers' Relay Race'"/

/Text/ The turned down, ragged edges of the pages eloquently attest that "The Schedule of Deliveries of Equipment for Start-Up Projects" is used not occasionally. Strict monitoring of its fulfillment has been established in the Ministry of Power Machine Building. However, it cannot be otherwise--this year the enterprises of the ministry should deliver their products to the 466 most important construction projects of power engineering, ferrous metallurgy, the coal, gas and chemical industries and other sectors of the national economy. They are not, it must be emphasized, ordinary products: two 500,000-kW units for the Ekibastuzskaya GRES, a 1 million kW unit for the Kurskaya AES, a block with a capacity of 800,000 kW for the Ryazanskaya GRES. It is hardly necessary to add anything else to this in order to characterize the importance of the tasks facing the machine builders.

Since the beginning of the year 12 power engineering projects have been fitted out. Equipment with a total capacity of nearly 3.5 million kW was delivered to them. The collectives of the Khabarovsk Power Machine Building Plant and the Biysk Boiler Plant have completely fulfilled the annual obligations to the start-up projects of power engineering. However, far from everything is going smoothly. The Chekhov and Belgorod power machine building plants, the Syzran' Turbine Making Plant and a number of others have not yet achieved the prescribed rhythm. Not without reason is "The Schedule of Deliveries" revealed as if by itself, customarily on the pages where the equipment, the dates of the production of which have not been met, is recorded. The constant attention of both the staff of the sector and the collectives of the enterprises is riveted on these items. Vigorous steps are being taken to correct the situation. But does everything depend on the machine builders?

The Nevskiy zavod Production Association, for example, did not meet the delivery deadline of regenerators for one of the stations of the Urengoy-Gryazovets gas pipeline. Did they not realize in the collective all the responsibility of the task facing them? They realized it perfectly well. But how is it possible to keep to the schedule, if there was simply nothing to make the regenerators out of--the Kuznetsk Metallurgical Combine left the Leningraders without stainless steel.

Such cases, unfortunately, are by no means uncommon. Numerous threads of cooperation link the enterprises of the Ministry of Power Machine Building with metallurgists, electrical engineers and machine builders of other sectors. Their achievements depend to an enormous extent on the timely placement of new capacities into operation by the construction workers. A breakdown in any, even the most insignificant of these links necessarily affects the end results and at times reduces to naught the efforts of many collectives.

The need for the preferential development of the base sectors of industry, and first of all the fuel and energy sectors, is emphasized in the decisions of the 26th party congress and in the report of General Secretary of the CPSU Central Committee Comrade L. I. Brezhnev. Taking into account the exceptional importance of this task, the leading collectives of the related sectors have come forth with an initiative: to set up operational control over the entire chain so as not to allow irregularities in any of its links.

The well-known principles of the "workers' relay race" were the basis for the movement. The competition under this motto firmly united many collectives of various sectors and regions of the country. Experience was gained: on the initiative of the Leningraders an agreement was concluded between 40 enterprises and organizations, which were linked by the designing, production and installation of equipment at a number of hydroelectric power stations. It was clearly specified in it: what each party should do and by what time, who should give whom what assistance in order in the end to bring the date of the start-up of the entire project as close as possible. In essence the goal program approach was applied to the organization of the competition. And as a result at the Sayano-Shushenskaya GES alone the early placement into operation of five units was ensured. By means of this it was possible to generate additionally more than 5 billion kWh of electric power and to save 1.5 million tons of conventional fuel.

Now the "workers' relay race" has been raised to a new, higher level--to the level of entire sectors. In all nine ministries--the Ministry of Power Machine Building, the USSR Ministry of Power and Electrification, the USSR Ministry of Construction, the USSR Ministry of Construction of Heavy Industry Enterprises, the USSR Ministry of Installation and Special Construction Work, the Ministry of the Machine Tool and Tool Building Industry, the Ministry of the Electrical Equipment Industry, the Ministry of Heavy and Transport Machine Building and the USSR Ministry of Ferrous Metallurgy--in their collegia jointly with the trade union central committees approved the agreement on the creative cooperation of the collectives of enterprises and organizations, which is aimed at the early placement into operation and the assimilation of capacities for the production of power equipment and at the speeding up of its deliveries to start-up projects. Staffs headed by the deputy ministers have been formed in the sectors. An intersectorial staff is also at work.

At present at the stage of the drafting and conclusion of agreements between enterprises a "stock-taking" of the established ties is as if taking place, the weakest points are being identified and measures designed to prevent possible disruptions are being envisaged. This work has been especially stepped up since the middle of May. Reports on the conclusion of 10, 15 agreements arrived on some days. Costs, quite naturally, were indispensable.

At the Moscow Dinamo Plant they willingly concluded an agreement with the Izhorskiy Plant imeni Zhdanov, but then initially responded to the Kusa machine builders with a rejection. More precisely, they agreed to guarantee the delivery of only 75 percent of the number of electric motors, which was stipulated in accordance with the assets. Such selectivity is quite easily explained. The Izhorskiy workers themselves deliver some items to the Muscovites, and therefore the latter are interested in strengthening the contacts with them. But the Kusa Machine Building Plant does not have any obligations to the Dinamo Plant. Hence the different attitude.

At the Cherepovets Metallurgical Plant in five out of nine cases they refused entirely to conclude agreements. They approached the matter in exactly the same way at the Orsk-Khalilovo Metallurgical Combine and a number of others. Moreover, not only the party committees of these enterprises, but also individual workers of the city and oblast committees of the CPSU in essence supported the stand taken by the economic managers.

It seems that these difficulties are to some extent natural. At the preceding stage of the "workers' relay race" the agreement on cooperation between two collectives necessarily presumed mutual obligations. Now the sectors are assuming such guarantees. For example, the Ministry of Power Machine Building is rigidly binding itself to deliver on the set dates equipment to 115 start-up projects of ferrous metallurgy. The metallurgical enterprises should ship their products just as punctually to the machine builders, regardless of whether or not specific plants are linked by reciprocal deliveries.

Of course, not everyone immediately understood this peculiarity. The situation was also aggravated by the fact that the machine builders themselves did not approach the matter everywhere just as seriously as, for example, at the Krasnyy kotel'shchik Association. And as a result some delegations, which arrived at related enterprises to conclude an agreement, obviously smelled a little of go-getting.

The intolerability of such an attitude was strictly pointed out to the managers of the enterprises of the sector in the collegium of the Ministry of Power Machine Building. Other ministries participating in the competition and party committees also performed similar work. It is possible to judge its effectiveness from the fact that today 214 agreements on creative cooperation have been concluded between associated enterprises and organizations.

The specific return is also becoming more significant with each day. Representatives of the Nevskiy zavod Association have just drawn up the specific points of an agreement with the Kuznetsk metallurgists, while cars with stainless steel have already left for Leningrad. The state of affairs has improved radically at the construction site of the new facilities at the Krasnyy kotel'shchik and Turbomotornyy zavod associations and a number of other enterprises.

The step of the "workers' relay race" is becoming more and more firm and confident. And this is a reliable guarantee that the stepped-up obligations of the machine builders--to complete for the most part during the first half of the year the delivery of equipment for 60 start-up projects of power engineering, and to ship it to the remaining start-up projects on the strictly planned dates--will be successfully fulfilled.

7807
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ROGUN HYDRAULIC DEVELOPMENT PROGRESS

Moscow STROITEL'NAYA GAZETA in Russian 17 May 81 p 1

/Article by I. Akhmetov (Tajik SSR): "The Experience of Nurek for Rogun"/

/Text/ The small village of Rogun is located on the left bank of the Vakhsh 70 km from Nurek. It also gave the name to the future hydraulic development, to which a GES with a capacity of 3.6 million kW will belong. The inexpensive electric power is intended for the further development of the entire Central Asian economic region, and first of all the Southern Tajik Territorial Production Complex with its aluminum and electrochemical industry. The reservoir of the hydraulic development will make it possible to increase the areas of irrigated land in the Tajik, Uzbek and Turkmen SSR's by 300,000 hectares.

Since the start of construction more than 50 million rubles have been assimilated here. Housing (no temporary structures) has been readied, roads have been laid, the priority facilities of the production base have been built. In other words, the preparation period lies behind. The main operations have begun.

"We are trying," says G. Tikhonov, manager of the Tadzhikgidroenergostroy Trust, "to adopt all the best things which were achieved at the construction site of the Nurekskaya GES, to enrich and improve the experience gained there."

This is natural if only because of the 2,000 workers employed today in Rogun, more than half are from Nurek. As in the past, the residents of the nearby alpine villages will be attracted to the construction project. A branch of the academic combine of the trust has been set up in Rogungesstroy. Last year alone more than 100 people graduated from it and 68 improved their skills. The brigade form of training with the attraction of experienced Nurek workers as tutors is being used extensively.

Following the example of Nurek the units will be started up here as the underground structures and the rock-fill dam become ready and the appropriate head of water is developed. That is, the hydraulic development will begin to operate long before its ultimate completion. Such an approach promises the national economy an enormous advantage.

A conveyer complex for transporting dirt will be introduced for the erecting of the tall dam from local materials. Little time remained to the start of the pouring of the dam, so the construction workers appealed to the Ministry of Power Machine

Building and the Ministry of Heavy and Transport Machine Building to begin the delivery of equipment for the heavy-duty conveyers in 1982. At a meeting of the participants in the construction, which was held in late 1980, it was decided on no account to lose the traditional friendly ties with related enterprises, first of all the plants supplying the equipment: the Uralelektrotyazhmash Plant, the Khar'kov Turbine Plant, the Zaporozhtransformator Plant, the Chekhov Gidrostal'konstruktsiya Plant and others. The first agreement on competition in accordance with the principle of the "Workers' Relay Race" was signed at the meeting.

One thing is alarming. Today the Tadzhikgidroenergostroy Trust can perform in Rogun work worth not less than 20 million rubles a year. But only 14.6 million rubles is planned for 1981--nearly 1.5 million rubles less than were assimilated last year. It's very likely the USSR Ministry of Power and Electrification is acting shortsightedly in this case.

7807
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BRIEFS

DUBOSSARSKAYA GES RENOVATION--Khar'kov--Specialists of the Ukrainian Scientific Research Institute of Planning of Hydroprojects of Khar'kov have begun the preparation of the technical and economic substantiation of the renovation of the Dubossarskaya GES. On the right bank of the Dnestr it is planned to erect another station, which is considerably more powerful than the current one, as well as a pumped-storage electric power station. It is planned to build a navigation lock on the left bank. [By G. Dolzhenko] [Text] [Moscow STROITEL'NAYA GAZETA in Russian 3 Apr 81 p 3] 7807

KANSK-ACHINSK EQUIPMENT--Irkutsk--During the 11th and subsequent five-year plans the Irkutsk Vostokenergomontazh Trust has to solve immense problems on the construction of the Kansk-Achinsk Fuel and Power Complex (KATEK). Whereas at the power projects of the past five-year plan the trust installed boilers capable of yielding 420 tons of steam an hour each, at the KATEK it is necessary to deal with boilers with a capacity of 2,650 tons. The height of such a giant thing is 100 m, while the weight without auxiliary equipment is 70,000 tons. The Vostokenergomontazh Trust is preparing thoroughly for the solution of the national economic problem. It has been decided to create a special works of the plant type for the consolidated assembly of the equipment. [By P. Adamov] [Text] [Moscow STROITEL'NAYA GAZETA in Russian 3 Apr 81 p 2] 7807

EKIBASTUZ-CHELYABINSK POWER LINE--Ekibastuz--The five mobile mechanized columns of the Spetselektroset'stroy Trust have begun the construction of the first 1,150-kV alternating current electric power transmission line in the country from Ekibastuz to Chelyabinsk. Now the work has been launched on the first 500-km section from Ekibastuz to Kokchetav. Next year it is planned to energize the first section of the electric power transmission line. [By A. Pavlov] [Text] [Moscow STROITEL'NAYA GAZETA in Russian 3 Apr 81 p 3] 7807

TAJIK ALPINE POWER LINE--Ishkashim--A high-voltage electric power transmission line has reached the most remote and mountainous village of the region--Langar, which is located on the headwaters of the Vakhan. This line, which is more than 100 km long, has provided two alpine sovkhozes--the Sovkhoz imeni Lenin and the Vakhan Sovkhoz--with power of the hydroelectric power station of Namanguty. The construction of the line was carried out under difficult conditions. The electric poles crossed many mountain ranges and water barriers. The installation brigades of D. Asadbekov, K. Adzhoibshoyev and D. Alamkhonov from the Khorog Mobile Mechanized Column of the Tadzhiksel'elektrostroy Trust displayed great persistence and skill. With the placement into operation of the last kilometers of this line the electrification of another remote region of the Gorno-Badakhshanskaya Autonomous Oblast for the most part has been completed. The electrifiers of the Pamirs have much work ahead. This year they have to complete the work in the mountainous population centers of Kalai-Khumbskiy, Vanchskiy and Rushanskiy Rayons and to continue the renovation of the electric power transmission line, which is more than 60 km long, from the hydroelectric power station imeni Lenin in Khorog to the Shugnanskiy Rayon village of Vir. [Text] [Dushanbe KOMMUNIST TADZHIKISTANA in Russian 19 Jun 81 p 1] 7807

ODESSKAYA NUCLEAR TETS--Odessa--The construction of a new nuclear heat and electric power station has begun 35 km from Odessa. The collective of the general contracting construction administration of the nuclear TETs of the Yuzhenergostroy Trust is performing the work. Subdivisions of the Odestransstroy and Chernomorgidrostroy trusts, the Odespromstroy Combine and others will work here along with it. The design organizations of Gor'kiy, L'vov, Kiev and Odessa have prepared a good base for the construction workers. And now everything has become animated at the site. The machines have begun to roar, the first cubic meter of concrete has been dumped. The Odesskaya nuclear TETs has started! The work was begun simultaneously in five places. In the future settlement of the power workers and construction workers the foundations have been laid for two nine-story apartment houses, which will be turned over this year. For the delivery of cargo to the construction project the first pile for the future pier has been driven at the Belgorod-Dnestrovsk port. The first cubic meters of crushed stone have been placed in the bed of the railroad siding and highway, which lead to the station. First Secretary of the Odesskaya Oblast Party Committee N. Kirichenko and leading workers and employees spoke at the meeting held on the occasion of the start of the construction of the nuclear TETs. The meeting participants adopted salutatory letters to the CPSU Central Committee, the USSR Council of Ministers and Comrade L. I. Brezhnev personally, to the Central Committee of the Communist Party of the Ukraine and the Ukrainian SSR Council of Ministers. Good journey, nuclear TETs! [By D. Georgiyev] [Text] [Moscow STROITEL'NAYA GAZETA in Russian 17 May 81 p 2] 7807

EKIBASTUZSKAYA GRES-1--The certificate on the placement into operation of the third power block of the Ekibastuzskaya GRES-1 has been signed. Its capacity is 500,000 kW. The operational tests conducted before this showed the great reliability of all the units of the turbine, the boiler and other systems of the unit. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 16, Apr 81 p 3] 7807

TYUMEN' GAS PREPARATION--The fifth enterprise for the preparation of natural gas for transportation has been put into operation in Novyy Urengoy (Tyumen'skaya Oblast). Upon reaching the designed capacity it will annually deliver 15 billion m^3 of raw materials. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 16, Apr 81 p 3] 7807

URENGOY-UKHTA-GRYAZOVETS PIPELINE--The welding of the pipes for the southern section of the route of the Urengoy-Ukhta-Gryazovets gas pipeline, which is under construction, has been completed. Of the 1,200 km of pipeline, which the collective of the Ukhtatransgaz Association serves, about 1,000 km have already been put into operation. The Urengoy-Ukhta-Gryazovets gas pipeline will be the fourth operating "thread" of the Siyaniye Severa Gas Transportation System. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 16, Apr 81 p 3] 7807

CENTRIFUGAL COMPRESSOR--The bench tests of a new centrifual compressor for the gas lift method of recovering petroleum have been successfully completed at the Kazan' Compressor Plant. It is 10-fold more productive than the current piston units. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 16, Apr 81 p 3]

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FUELS

EXPEDITIONARY TEAM METHOD IN WESTERN SIBERIA DESCRIBED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 4 (82), Apr 81 pp 142-145

/Article by V.T. Permyakov, candidate of economic sciences, chief, Laboratory of Economic Research, Giprotyumenneftegaz, Tyumen': "The Expeditionary Team Method in Western Siberia"7

/Text7 The team and expeditionary team method (VEM) of organizing work has its positive and negative sides. Partly because there is not yet a universally recognized concept of the method, discussions of a number of interpretations of it are continuing. In our opinion, the differences are caused by an unintegrated and unsystematic approach, as well as an incorrect interpretation of the criterion determining the effectiveness of the introduction of the VEM.

It seems to us that this method of organizing work should be regarded primarily as being caused by special circumstances: mobility of the locations where the work must be done, extreme natural and climatic conditions, requirements for the accelerated development of a region, and inadequate development of the social and domestic infrastructure. Every worker wants to find himself in the circle of his own family every day. With rare exceptions, consequently, it is necessary to do everything possible so that the stationary method of organizing labor be dominant.

If we take a broader view and approach the problem of organizing work activities both integratedly and systematically, the development of an independent VEM concept is not advisable. It is necessary to develop a set of methods for organizing labor in a region, even if for each branch by itself, with due consideration for the specific nature of the areas where the work will be done and the types of labor activity involved.

The basic methods for organizing work in the oil industry in Western Siberia include: stationary, team, intraregional expeditionary team and interregional expeditionary team. Each of them has its own modifications.

One of the most important problems is preplanning substantiation of the combination of methods and modifications used for a definite perspective and in a definite branch of specialization. As of yet, there is none of this type of preplanning study or even methodical principles.

The effectiveness of planning decisions -- primarily the determination of the necessary volume of residential and civil construction, the refinement of the general plans for the development of transport, the selection of sites for settlements and so on -- depends on the correct establishment of proportions.

Until now there has been no clear definition of the differences between the ordinary team method and the expeditionary team method. The VEM itself has several variants and, in addition, has unequal possibilities and is not needed equally in different branches of specialization in the complex.

This method can be used more widely in construction, primarily because the location of builders' work changes constantly. The most mobile work is that of main pipeline builders, while the least mobile is that of those engaged in erecting objects of concentrated construction, although even here productive work cycles have a clearly expressed tendency toward shortening in connection with the development of industrial methods for setting up a deposit, primarily because of integrated-block construction.

Thus, there is actually a real need and potential possibilities for the propagation of the expeditionary team method when construction and installation work is being done on an enlarged scale in a region.

For oil workers, the picture is somewhat different. The life cycle of the development and exploitation of an oil field lasts from 30 to 50 years. The drilling out of a field and its setting up for exploitation occupies practically all of this period, whereas the place where the work is done does not change during this time.

Besides this, the specific nature of the work being done is of substantial importance from the viewpoint of the spread of the VEM. For instance, although there are no categorical objections to the use of the VEM in drilling, construction and transportation organizations, only the stationary method of organizing work is desirable and convenient when the work involved is the direct extraction of oil.

The VEM problem is complex even within the framework of a single branch. The huge savings counted on from the use of the method sometimes lead to a recommendation that it be introduced as widely as possible, and sometimes even the question is raised of whether or not, in general, to continue to build stationary working settlements and develop cities in regions that are being newly exploited. Such a formulation leads to artificial retardation of the development of the social and domestic infrastructure in the oil and gas regions of Western Siberia, and this is precisely why it should be avoided.

This being so, then in selecting the method of organizing work we should be guided not by the monetary criterion but the interests of preserving the workers' well-being and providing them with normal social and domestic living conditions. This means that a method that deliberately provides for extended isolation of a worker from his family, with the physical and psychological overloads that entails, should be considered only under conditions of the most extreme necessity.

For specific groups of oil fields that are in the exploitation stage and have been selected for development, in the preplanning order it is necessary to work out the specific work organization plans, with substantiation of the choice of the most suitable one from the entire set of methods (stationary, team, expeditionary). On the instructions of USSR Gosplan, the Giprotyumenneftegaz institute prepared a technical and economic report on the extensive introduction of the expeditionary team method of performing work at Glavtyumenneftegaz's /Main Administration for Petroleum and Gas for the Tyumen' Region/ enterprises.

One of the causes -- although not so much objective as subjective in nature -- making the widespread introduction of the VEM necessary is the delay in introducing living quarters for workers moving to Siberia from the more densely populated regions of the country. This once again confirms the necessity of a sharp expansion in residential and civil construction in regions that are being developed.

In Siberia it is necessary to build cities and modern workers' settlements and, in a number of cases, one- and two-story houses with personal plots of ground. A resolute course should be taken toward the creation of comfortable wooden settlements close to the place where they work for workers from the nearest oil fields.

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11746
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LACK OF PLANNED DEVELOPMENT IN KHANTY-MANSIYSK DECRIED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 4 (82), Apr 81 pp 145-147

/Article by S.S. Chikirev, chairman, Planning Commission, Executive Committee, Council of People's Deputies, Khanty-Mansiysk, Khanty-Mansiyskiy Autonomous Okrug: "The Perspective Must Be Known"/

/Text/ Every second ton of oil in the Soviet Union comes from the Khanty-Mansiyskiy Autonomous Okrug. Here, in a comparatively short period of time, a system of oil and gas pipelines has been built, a large energy base has been created, and gas processing plants have been erected, while the cities of Surgut and Nizhnevartovsk, each with a population of more than 100,000, stand where formerly there were only settlements. In short, the country's main based for oil extraction has been created successfully here.

But what has been done in the area of governing the region? Unfortunately, very little. As a result, there is an increasing disproportion between the oil industry and its high power-to-worker ratio and the poorly mechanized branches of the national economy that are traditional in the region: timber and fish. The residential and civil construction rate lags behind the rates at which the production base is being created. At the present time, the rate of development of local industry and the food, meat and milk industries is not satisfactory, nor are domestic services.

The territorial production complex needs a clearcut, scientifically substantiated strategy for development. The lack of such a strategy has resulted in a controversy that still lives: should cities be built in the North or not? Life has convincingly demonstrated the groundlessness of such doubts. Since 1964 the population of Khanty-Mansiyskiy Okrug has tripled and cities and settlements with multistory houses are growing up. However, the question of a common customer and a common architectural planning scheme has still not been answered.

The lack of this strategy resulted in a situation in the okrug where at the very peak of the work on developing the oil fields, the construction industry's base was just barely completed. For a long time the production capacities of the Surgut House Building Combine and the Lokosovskiy Brick Plant were not developed, while the house building combine in Nizhnevartovsk has just been built and all the planned residential construction (300,000 square meters) must be assembled from imported parts.

Until now, a fear of wasted city building expenditures and empty "gilded" houses and cities has been expressed frequently. But this, in the first place, should not happen if there is integrated development of the city, the settlement and the region itself. In the second place, even if it should happen in part, we must not forget that capital investments in this okrug are recovered almost entirely within a year. Finally, the main productive force is man, who must live and work under normal conditions.

The team and expeditionary team methods of development have been suggested as a way out of the situation that has been created. "Base city-team settlement" is the plan that was approved in Tyumenskaya Oblast and is now the most successful variant in bringing together the working site and more or less normal residential and domestic conditions for the workers. As far as the expeditionary team method is concerned, it still has to prove its effectiveness. This will be difficult to prove, at least to the "flying" drillers at the Surgut and Tyumen' airports. What can be said to them? That someone was needlessly afraid of spending money for housing?

We agree that the team method is both acceptable and necessary. But what is it today? It is just an activity in and of itself. Where is the plan for a type team settlement and the medical and biological substantiation for the team members' working and leisure conditions? Although we must now talk not about the plan, but about an actual, transportable and comfortable town for oil workers, loggers, fishermen and builders.

The theses advanced in EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA's collection "The Team Method of Developing New Territories" are quite interesting. But there is something that needs mentioning. In the first place, there is a lack not only of capital housing, but temporary housing as well. At the same time, plans are being made to involve up to 300,000-350,000 people in the expeditionary team method. In the second place, the expeditionary team method requires new construction and installation work methods, for which it is proposed to use helicopters and dirigibles. Right now there are not enough helicopters to merely change teams. Finally, as is obvious from the articles in the collection, the development of this gas and oil province is scheduled for periods in the far future, and not just for 10 years. So why are we talking about wasted city building expenditures when they will be recovered more than once during this period?

In our opinion, the lack of a unified strategy for developing this region affects not only the housing question, but also the technology. For example, what is the explanation of the fact that, as before, we are still talking about desires for hot drilling, for northern versions of equipment, for swamp buggies, for special versions of specialized clothing? Maybe someone thinks that everything will soon be finished in the North?

The territorial production complex needs a single master for financing, planning, resolving interdepartmental conflicts, and deciding on an integrated, multipurpose social and economic program. At the 25th CPSU Congress, Comrade L.I. Brezhev said: "The question of improving methods for the integrated solution of large, nationwide interbranch and territorial problems cannot be put off. Here we need unified, centralized programs that encompass all stages of the work, from planning to practical realization. It is important that in each case there be specific agencies and specific people bearing the entire responsibility and coordinating all the efforts within the framework of one program or another."

Now, as never, we need the coordinated activity of many departments for the rapid, rational and effective solution of these and other problems. When, for example, is it more necessary to have paved roads to a field: during its setting up or during normal exploitation? In the former case, undoubtedly. In practice, however, hundreds of thousands of tons of freight have to be delivered to work sites in expensive aircraft, because there are no roads. When the "paving" finally appears, the only transport that moves over it is a few trucks carrying maintenance personnel. No less rare are cases where the construction of electric power transmission lines lags behind the beginning of exploitation of a field by several years. It is also obvious that it is only a lack of coordination that can explain the fact that Nefteyugansk is not on the railroad line and that industry in Nizhnevartovsk and Nefteyugansk was developed along such narrow lines.

Because of the lack of a farsighted strategy and coordination, irresponsible technological programs are introduced. The gas processing capacities were introduced with a delay of almost 5 years, and even now this cycle has not been provided with a finished production process. Because of the limited dispatching facilities, part of the processed product has to be burned, and only half of the casing-head gas is utilized. In this region where oil is extracted, tens of thousands of tons of gasoline, kerosene, fuel oil and oils have to be imported, although all of it could have been produced locally long ago. This probably would not have happened if everyone had understood that we will be in this area for a long time and that it is necessary that our activities here be well thought out.

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11746
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DEVELOPMENT OF EQUIPMENT FOR HELIUM PRODUCTION

Kiev RABOCHAYA GAZETA in Russian 7 May 81 p 1

/Article by I. Kalashnikov, senior correspondent of the press center of the Ministry of Chemical and Petroleum Machine Building (Sumy-Orenburg): "For 'Solar' Gas"/

> /Text/ In recent years the collective of the Sumy Machine Building Production Association imeni M. V. Frunze has assimilated the production of many types of modern equipment.
>
> The production of heavy-duty units for the output of helium became a new major landmark in the biography of the collective. The productivity of one such unit is 3 billion m^3 a year. The work was honored with the 1980 USSR State Prize.
>
> In accordance with the results of the All-Union Socialist Competition during the 10th Five-Year Plan the collective of the association was awarded a Challenge Red Banner of the CPSU Central Committee, the USSR Council of Ministers, the AUCCTU and the Komsomol Central Committee.

"From the very start it was clear: it is impossible to compare the equipment with what we previously produced," recalls Vladimir Matveyevich Luk'yanenko, general director of the association. "The new unit should weigh 10-fold more than the machines of the old list. We did not even have cranes with the necessary lifting capacity."

Frequently in such a situation they send "envoys" to the ministry and ask that the assignment be removed from the plan. Two other, no worse plants of the sector acted in precisely this way. In precisely this way the project came to a third enterprise in Sumy. And the client needed the unit: a helium plant had begun to be constructed at the base of the Orenburg gas deposit, the largest in the country.

The question was essentially as follows: either the machine builders would assimilate the production of such a unit, or the gas industry workers would have to buy equipment from foreign firms. Thus, it was a matter of the prestige of the entire sector. An exceptionally difficult examination had to be taken.

The technical divisions and services of the Association imeni M. V. Frunze studied the design documents and consulted with scientists. They even hired I. L. Andreyev, chief designer of helium equipment from the Leningrad Scientific Research Institute of Chemical Machine Building. And as the design documents were studied, the interest in them increased. The design captivated and excited people with its bold ideas and innovative solutions. New materials, which had previously not been used in the sector, an original design of the equipment, its unusual arrangement--all this afforded great freedom for creative work.

Many sectors need helium: for the cooling of nuclear reactors, for spacecraft, for research in low-temperature physics and for the most critical types of welding and smelting of metals. "Solar" gas is used in medicine, electrical engineering, diving.

And the plant designers sat down at the drafting tables and began to draw up the manufacturing documents. The manufacturing engineers and the welders assimilated new advanced processes, the engineers modernized the available machine tools.

The high-strength steel, which the designers incorporated in the design, was the toughest nut. It was necessary to learn to bend the metal, to mill, machine and weld it.

The production workers carried out this difficult search jointly with scientists of the Institute of Electric Welding imeni Ye. O. Paton and with other scientific institutions. It is possible to state the result in one phrase: it was possible by joint efforts to introduce such advanced processes as electroslag and pulsed-arc welding, welding with granulated fillers, which also solved the problem.

One must not, however, think that the production workers expected ready-made solutions. For example, while the electrohydropulsed process was being developed, the plant workers constructed a special building for the performance of these operations. Polyethylene holders were needed--they organized their production in one of the shops. At the same time they trained the machine operators.

The association had to solve on its own a large number of major and minor problems, especially at the stage of preproduction.

The Sumy workers not only produced the equipment, but also took an active part in its installation. A large brigade of the most skilled welders worked for months on the assembly of the equipment, its breaking in and start-up.

All this, taken together, also brought success. At the Orenburg Helium Plant the well-proportioned units many meters tall, which are streaked with silver and are clad in delicate laces of pipes and metal structural components, flew upwards like rockets.

"The helium equipment is operating reliably and steadily and is producing a product needed by the country," says Yu. F. Vysheslavtsev, general director of the Orenburggazprom All-Union Industrial Association. "We can only say 'thanks' to both the designers and the machine builders."

7807
CSO: 1822/191

FUELS

BRIEFS

YAKUTIA GAS PIPELINE--Yakutsk--A mobile mechanized column for laying the first gas pipeline in the northern region has been set up in the Yakutgazstroy Trust. The length of the steel main should exceed 100 km. It will unite the Srednebotuobinskoye deposit, which was recently discovered by geologists, with the diamond miners' city of Mirnyy. In 1983 inexpensive blue fuel will begin to arrive there. It will entirely meet local production and household needs. Work is now being performed on the equipment of a special area for electric welders. The semi-automatic fitting of large-diameter pipes into units 36 meters long is beginning there. Then heavy-duty trucks will deliver them to the site of the laying. [By V. Nikolayev] [Text] [Moscow TRUD in Russian 16 Jun 81 p 1] 7807

CSO: 1822/191

DEVELOPMENT, PRODUCTION OF EQUIPMENT FOR THE NORTH

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 16 Jun 81 p 2

/Article by First Deputy Minister of Heavy and Transport Machine Building R. Arutyunov: "Equipment for Northern Purposes"/

/Text/ Today the high and steady rate of development of our economy and, consequently, of the increase of the standard of living of the Soviet people directly depends on the extensive commitment to the economic turnover of the natural resources of the eastern and northern regions of the country. That is why the party is consistently implementing the program of increasing the economic potential of these regions. However, it is possible to develop them only by means of the most modern equipment. And not ordinary equipment, but, as I would say, equipment of a direct purpose, which is capable of operating reliably at temperatures as low as -50 to -60 degrees.

We know from experience how difficult a matter this is--to develop machines of northern design or, as they are called, of series KhL. Many technical questions here have still not been solved. But, perhaps, it is even more difficult to organize the production of such equipment. Even today not only our sector, but also all other suppliers of equipment for the northern regions are constantly faced with complications which are caused by the notorious departmental barriers. I would like to speak about this.

During the past five-year plan our enterprises developed and began to deliver many models of new equipment of northern design. There are, for example, the cluster drilling units for the recovery of petroleum, which are designed for the swampy areas of Western Siberia, drilling rigs of rolling cutter drilling, rigs of pneumatic percussion and thermomechanical drilling for the building of pile piers and foundations in permafrost, gantry and laying cranes, heavy-duty excavators, diesel switchers, special belt conveyors and other machines. Among them diesel engines, which are used in dump trucks, diesel locomotives, drilling rigs and power plants, hold a special place.

In short, the sector has gained some experience in the development and production of equipment for the northern regions of Siberia and the Far East. However, during the current five-year plan the tasks facing us, of course, are increasing. In order to cope with them we have elaborated in our sector an intrasectorial program. It clearly specifies the head institutes and enterprises, which are responsible for the development of one type or another of machines of northern design. The dates of the production of the prototypes are set. We have to set up the production of the equipment which the construction workers, transport workers, miners and geologists of Siberia and the Far North urgently need.

However, unfortunately, our intentions do not always coincide with the plans of related sectors. For this reason serious obstacles often stand in the way of northern equipment. Take if only the same diesel engines. During the current five-year plan it is planned to develop and assimilate the production of new models in order to meet the demands for them. But their reliable operation under automatic operating conditions can be ensured only with the provision of the engines and units with the necessary instruments, devices, materials, fuel and oils. The diesel engine makers have repeatedly turned to the Ministry of Instrument Making, Automation Equipment and Control Systems in order to obtain, for example, more perfect shutoff devices, relays of the rate of rotation and a thermoelectric diesel unit and to the Ministry of the Electrical Equipment Industry to obtain modern electrical equipment. However, the requests remained unmet. In general the modification of instruments and automation equipment of approximately 40 descriptions is necessary in order to fit diesel engines and units with them with the complete guarantee of reliable operation at low temperatures. The lack of cold-resistant industrial rubber items, the production of which the USSR Ministry of the Petroleum Refining and Petrochemical Industry simply cannot set up, to say nothing about special grades of diesel fuel and oils, is also creating many obstacles.

The experience of operating excavators in the regions of Krasnoyarsk and Irkutsk has shown that at temperatures below 20 degrees the number of failures of buckets, drawbars, track and bottom shafts increases sharply. When the temperature falls to -40 degrees there are four- to fivefold more of them than under ordinary conditions, while flexible high-voltage cable is turned into an inflexible braid. The cause of the failures is well known--there are the brittle ruptures of steel and the appearance of cracks. In order to avoid this and, hence, downtimes of highly productive expensive equipment, special cold-resistant alloy steels must be used in its designs. However, the USSR Ministry of Ferrous Metallurgy so far is not completely meeting our needs for them.

We are not receiving from the Ministry of Chemical and Petroleum Machine Building the urgently needed worm compressor units in the necessary amounts, from the Ministry of the Electrical Equipment Industry--electric motors, transformers, high-voltage cables and vacuum switches. It is possible to mention control systems, sensors, you will not, as they say, enumerate everything.

So, is it that our related industries do not understand how important these items are and that precisely they in many ways determine today the level of northern equipment, its quantity and in the end its efficiency? There would not seem to be any grounds to say this, because we do not receive, as a rule, a direct refusal. Let us say that the USSR Ministry of Ferrous Metallurgy usually responds to our requests to supply steel of the necessary grades with understanding: the dates and the specific enterprises, which will fill the order, are named. But time passes, and there can be no question of filling the order. The metallurgists find many excuses--they tell us about the technical unreadiness and the lack of special fillers and cite tens of other reasons. But we know well that these are in reality only excuses.

The point is that at present we are producing equipment for the north in small batches, or else only one at a time. At the same time, according to the estimates of specialists, 20-25 percent more assets and labor are spent on the average on its production than on conventional equipment. Moreover, it is necessary to have the corresponding equipment and to use a special manufacturing method. In other words, it is unprofitable for related industries to produce materials and components of northern design, and therefore they try to escape the fulfillment of such assignments.

Another serious difficulty consists in the lack of precise coordination. For it is not enough for rolled products, a heavy-duty electric motor or a washer worth a kopeck to be produced in a northern design, it is necessary for them also to be delivered to the plant on time. Unfortunately, for the present one cannot speak of any synchronism. The machine builders often have to install conventional materials and components. And as a result under the difficult operating conditions the equipment frequently breaks down, enormous amounts of capital are spent on its repair.

It seems that both of these problems could be successfully solved within a goal program on the development and output of equipment of northern design, as well as materials and components for it. It would make it possible to unite the efforts of all those involved in this important matter, to formulate the tasks clearly and to increase the responsibility for their fulfillment. For its preparation it seems expedient to form within the State Committee for Science and Technology a standing commission which would subsequently monitor the progress of the work on machines of series KhL.

And, of course, it is necessary to give serious thought to how to increase the economic interest of sectors and enterprises in the production of this equipment, materials and components for it. We can make as many demands as we want on metallurgists or chemists, but we will hardly find a common language with them until the output of series KhL ceases to be a burden on the economy of their enterprises.

I would also like to dwell on another thing. Under severe climatic conditions it is more difficult to ensure the constant technical readiness of equipment, especially in winter. The bases of the enterprises supplying complex highly productive machines, which have been organized right at the sites of operation, can help the matter. Attaching great importance to this problem, the Ministry of Heavy and Transport Machine Building with the participation of the USSR Ministry of the Coal Industry, the Ministry of the Electrical Equipment Industry and the Ministry of the Machine Tool and Tool Building Industry issued a joint order. In conformity with it this year such bases for the centralized maintenance of excavators of large unit capacity will be set up at enterprises of the coal industry. We are confident that this form of cooperation of the machine builders and the operators in the end will ensure the continuous operation of the equipment and will sharply decrease the demand for spare parts.

There is no need to repeat how important the development of the productive forces of the eastern and northern regions of the country is for our entire economy. And special equipment of a large unit capacity, which has greater reliability and is convenient to operate, should play a paramount role here.

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CSO: 1822/191

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